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ENDANGERED SPECIES

Technical Bulletin

Department of interior. U.S. Fish and Wildlife Service
Endangered Species Program, Washington, D.C. 20240

Woodland Caribou Listed as Endangered in Emergency Rule

The only population of caribou that still regularly occurs in the conterminous United States has been declared Endangered in an emergency rule (F.R. 1/14/83). Sometimes known as the southern Selkirk Mountain herd, this very small population of woodland caribou *(Rangifer tarandus caribou)* found in northeastern Washington, northern Idaho, and southern British Columbia (Canada), has fallen to a level that probably cannot sustain the herd much longer. Illegal hunting, habitat loss, collisions with motor vehicles, and inbreeding problems are the primary threats to the herd. The emergency listing will remain in effect for 240 days (until 9/12/83), during which time the Service intends to proceed with a proposal for a permanent rule.

Background

Both the caribou of North America and the reindeer of Eurasia belong to a single species, *Rangifer tarandus.* One subspecies, the woodland caribou *(R. t. caribou)* once occupied nearly the entire forested region from southeastern Alaska and British Columbia to Newfoundland and Nova Scotia. In the conterminous U.S., populations occurred in Maine, New Hampshire, Vermont, New York, Michigan, Wisconsin, Minnesota, Montana, Idaho, and Washington. Largely because of killing and habitat alteration, indigenous caribou disappeared from New England by about 1908 and from the Great Lakes States by 1940. A few individuals wandering across the border from Canada into Minnesota and Montana have been reported in recent years, but they are not members of the herd covered by this rule.

The only caribou population that still regularly occurs in the conterminous U.S. is the southern Selkirk Mountain herd. Early records indicate that, in the 19th century, caribou were plentiful in the mountains of northeastern Washington, northern Idaho, and southern British Columbia. By 1900, however, unrestricted hunting led to a major reduction in numbers. Logging of old-growth trees that bear lichens, the major part of the caribou's winter diet, contributed in the decline. Among the other factors, especially as the population drop accelerated in recent decades, have been low rates of calf survival and a lack of immigration from other herds. The absence of natural augmentation to the isolated population from outside sources causes the herd to rely on inbreeding for recruitment and reduces the genetic variability of the offspring, further weakening the viability of the herd. With a current population of only 13-20 individuals, the woodland caribou is one of the most critically vulnerable mammals in the U.S..

At such low levels, the herd is increasingly jeopardized by illegal hunting. Poachers killed at least one animal in each of the years 1980, 1981, and 1982, in addition to those taken unlawfully in previous years. Caribou are relatively easy for hunters to approach and shoot. There is also the possibility that a licensed deer or elk hunter could shoot a caribou by accident. The threat to the herd is greatest where the caribou frequent areas with good road access for hunters. (Fortunately, the herd has spent more time during the past decade in the Canadian portion of its range where there are fewer roads.) Previous restrictions have not been effective in stopping the poaching. The situation has now reached such a critical state that the premature death of even one more animal could mean the difference between survival and extinction for the herd.

In addition to the problem of increasing access to the habitat, road construction is adding to the potential for caribou-vehicle collisions on U.S. Forest Service (USFS) roads used by loggers, miners, and recreationists. Accidents involving deer are known to occur. Much of the caribou habitat in Washington and Idaho is on land managed by the USFS. Although that agency considers the woodland caribou to be a "sensitive species," it has allowed a considerable amount of timber harvesting and road building in old-growth forests within the southern Selkirk population's range. Some of this activity has been having adverse effects on the herd.

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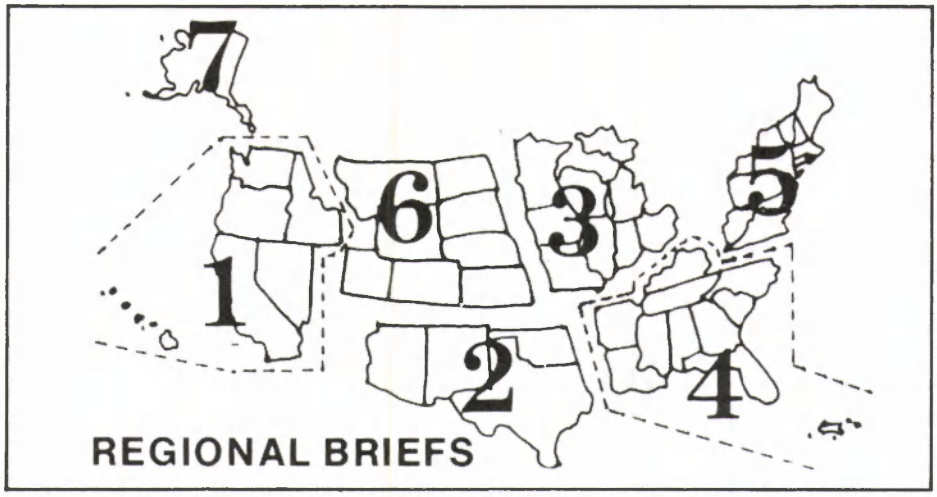
Photo by Jasper Carlton

A bull caribou feeding in the forests of the Selkirk Mountains, northern Idaho.



REGIONAL BRIEFS

Endangered Species Program regional staffers have reported the following activities for the month of December:

Region 1—A meeting of the Mohave Tui Chub Advisory Group was held on November 9, 1982, in Barstow, California, to discuss the recovery effort for this Endangered fish. Representatives from the U.S. Fish and Wildlife Service, Bureau of Land Management, California Department of Fish and Game, Desert Studies Consortium, several California universities, and Barstow School District were in attendance. The Mohave tui chub (*Gila bicolor mohavensis*) was formerly found throughout the Mohave River but now exists only in three refugia. A die-off recently occurred in one refugia, and a second population is not considered secure because of its small size. The Mohave River no longer provides suitable habitat because of hybridization with the exotic arroyo chub (*Gila orcutti*), which has become established throughout the river. The primary topic of discussion at the meeting was potential transplant sites for the Mohave tui chub. Camp Cady Wildlife Area, Afton Canyon, and the Mohave Narrows Regional Park were identified as the primary potential sites. These areas are located along the Mohave River, but are separated from the main flow that contains the exotic arroyo chub.

On November 26, 1982, staff personnel from the Sacramento Endangered Species Office and the U.S. Forest Service-Truckee District conducted a site visit to the only known population of the Endangered Truckee mahonia, or barberry (*Berberis sonnei*). The purpose of the visit was to stake and tag various individual stems of the plant prior to anticipated heavy winter snows so that cuttings could be taken later this winter while the plant is dormant. Cuttings will be used for various studies and to propagate additional plants to assist in the recovery of the species.

The Truckee mahonia is a low-growing evergreen shrub with pinnately compound leaves of five narrowly oblong leaflets. Its sulphur-yellow flowers occur in dense clusters called racemes, and have a fragrance reminiscent of carnations. Clusters of bluish-purple, pea-sized fruits are usually visible by mid-summer. Stems of the Truckee mahonia emerge from the rocks and cobbles along approximately 35 m of the Truckee River in three places. All of the plants occur on private land in an area of perhaps 100 m^2.

During early August 1982, a maintenance worker for the James Campbell National Wildlife Refuge at Kahuku, Island of O'ahu, Hawai'i, noticed some turtle tracks and diggings on the beach adjacent to the refuge. This important sighting was reported to George Balazs, of the National Marine Fisheries Service, and a biweekly monitoring schedule was set up. Hatchlings emerged on September 24. On September 28, Balazs visited the site and dug up an old nest, recovering several green turtle (*Chelonia mydas*) egg shells. This is the first recorded case of a green turtle nesting on O'ahu.

Region 2—Little Creek, in the Gila National Forest (Arizona), was stocked with over 100 Endangered Gila trout (*Salmo gilae*) on December 5, 1982. The fish were brought in by helicopter from South Diamond Creek and dispersed along Little Creek by personnel from several State and Federal agencies. This release culminates more than 7 years of planning and coordination among these

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U.S. Fish and Wildlife Regions

Region 1: California, Hawaii, Idaho, Nevada, Oregon, Washington, and Pacific Trust Territories. **Region 2:** Arizona, New Mexico, Oklahoma, and Texas. **Region 3:** Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin. **Region 4:** Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Puerto Rico, and the Virgin Islands. **Region 5:** Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia. **Region 6:** Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming. **Region 7:** Alaska.

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Condor Update—Research and Captive Propagation Effort Widened

The cooperative effort between the Service and the National Audubon Society to prevent the extinction of the California condor (*Gymnogyps californianus*) has been widened by recent decisions of the California Game and Fish Commission that allow for an intensified research and captive propagation program. Recent surveys that use photographic identification of individual birds indicate that only about 20 birds remain, a number significantly lower than the estimate of 30 in recent years through older census techniques.

On January 7, 1983, the Commission made the following rulings: 1) Permission was given to radio-tag an additional two condors of any age, although adults can be captured only until January 31, 1983, the start of the breeding season. 2) First eggs can be taken from any nest for artificial incubation and eventual captive breeding since it has been proven that California condors can lay a second egg if the first is lost. 3) An underweight, immature male condor that was taken to the Los Angeles Zoo on December 5, 1982, to gain weight will be retained in captivity for breeding purposes. 4) Alternate capture techniques may be used to trap an unpaired adult condor that is believed to be a female. The bird will be used in the captive breeding program. Cannon-netting, the method used thus far in the California condor program, is not appropriate in the location this individual inhabits, and alternatives that have proven effective to capture Andean condors (*Vultur gryphus*) may be used.

The permit issued to the Service in 1982 allowed up to two birds to be radio-tagged. The first condor was captured in October, and the second was trapped November 13 with its mate. The two birds approached the bait so closely that one could not be captured without taking the other. No problems were encountered in trapping or handling the birds. The bird that blood sample analysis later identified as male was fitted with identification tags and two small, solar-powered transmitters. One of the radios contains a 7-year pacemaker battery that switches on automatically at night or whenever sunlight cannot reach the transmitter's solar cell, insuring a continuous signal for the trackers. This radio allows the researchers to chart the bird's movements, and to locate the condor if it dies in such a way that solar radiation cannot reach the transmitters. Since the condor mortality rate appears to be even greater than originally thought, perhaps as many as four or five being lost each year, radio tracking could help the research team determine the causes and work toward a reversal of the downward trend.

The research team has resumed its efforts to trap a female condor for captive propagation with Topa-Topa, the male at the Los Angeles Zoo. Meanwhile, the male condor chick removed from the wild in August 1982 after parental neglect continues to do well at San Diego Wild Animal Park.

CITES NEWS—
December 1982

The Endangered Species Act of 1973, as amended in 1979, designates the Secretary of the Interior as both the Management Authority and the Scientific Authority of the United States, for the purposes of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Management Authority responsibilities are delegated to the Associate Director—Federal Assistance; Scientific Authority responsibilities are delegated to the Associate Director—Research.

The Service's Wildlife Permit Office (WPO) functions as staff to the U.S. Management Authority for CITES, assuring that wildlife and plants are exported or imported in compliance with laws for their protection and issuing permits for legal trade of these species. The Service's Office of the Scientific Authority (OSA) functions as staff to the U.S. Scientific Authority for CITES. OSA reviews applications to export and import species protected under CITES, reviews the status of wild animals and plants impacted by trade, makes certain findings concerning housing and care of protected specimens, and advises on trade controls.

Additional Proposal Decisions Announced

A notice was recently published announcing the Service's decisions regarding 11 animals and 24 plants that were identified in previous notices (F.R. 2/16/82 and F.R. 9/7/82) as candidates for United States proposals to amend the CITES appendices (F.R. 12/27/82). Proposed amendments announced in this notice, along with those announced in an earlier notice (F.R. 11/17/82), will be submitted for the consideration of the CITES nations at the next regular meeting in April 1983.

Comments and information received in response to earlier notices, as well as the views of authorities in the various countries where these species occur, were considered by the Service in determining what decision should be made regarding each proposal. A summary of these decisions follows:

- Indian pangolin (*Manis crassicaudata*), Malayan pangolin (*Manis javanica*), and Chinese pangolin (*Manis pentadactyla*)—Information on population status is needed on all species to determine if they are threatened with extinction. The Service will not propose to transfer these species from Appendix II to I.
- White-lipped peccary (*Tayassu pecari*) and Collared peccary or javelina (*Tayassu tajacu*)—Information on population status is not adequate to justify adding these species to Appendix II at this time.
- African wild ass (*Equus asinus*)—The species is much reduced in distribution and subject to hunting although it is afforded legal protection in the countries of origin. There is documented potential for international trade in live specimens. The Service has decided to propose this species for addition to Appendix I, excluding domesticated stock from the listing.
- Caninde macaw (*Ara caninde*) and Red-fronted macaw (*Ara rubrogenys*)—Based on evidence of low numbers, restricted distribution, and growing international trade, the Service has decided to propose transferring these species from Appendix II to I.
- Wattled crane (*Bugeranus carunculatus*)—The species is not yet threatened with extinction, although it may become so in the future unless measures are taken to protect its habitat. International trade does not appear to be a significant factor in the species' decline. The Service has decided not to propose this species in Appendix I.
- Yacare (*Caiman crocodilus yacare*)—Even though there is extensive international trade in skins and manufactured products of *C. crocodilus*, some of which involves this subspecies,

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Rulemaking Actions—December/January

Protection Extended for Two Ash Meadows Species

Two desert fishes that are endemic to Ash Meadows, Nevada, and threatened by a large residential/agricultural development have again been temporarily listed as Endangered in a second emergency rule (F.R. 1/5/83). A determination of Critical Habitat was included in the rule. Both species, the Ash Meadows speckled dace *(Rhinichthys osculus nevadensis)* and the Ash Meadows Amargosa pupfish *(Cyprinodon nevadensis mionectes)*, were listed temporarily in an earlier emergency rule May 10, 1982, which expired January 5, 1982 (see story in the June 1982 BULLETIN). Simultaneous with the publication of the second emergency rule, the Service proposed listing the two fishes on a permanent basis and making a final determination of their Critical Habitat.

Ash Meadows is a unique and diverse desert wetland ecosystem made up of a number of springs and seeps in a valley about 110 kilometers northwest of Las Vegas. It has the distinction of containing the highest concentration of endemic animal species in the continental United States as well as a number of endemic plants. The fragile springs upon which most of these species depend are fed by an aquifer consisting of "fossil water" deposited more than 10,000 years ago. Unfortunately, a large development planned for the area threatens the endemic species with extinction through excessive use of surface waters and "mining" of the slow-recharge aquifer, both of which would destroy the springs and downgradient wetland habitat. Several of the springs were already damaged prior to the first emergency rule.

Although the Bureau of Land Management (BLM) is the principal landowner in Ash Meadows, Preferred Equities Corporation (PEC), a developer, owns most of the surface water rights. Completion of a proposal for a final listing was delayed pending negotiations between PEC and BLM for a land exchange, which would insure conservation of the springs while providing PEC with an alternate site for its development. Extended protection for the fishes became necessary after proposed additional negotiations were unsuccessful. Nevertheless, under Sections 7 and 9 of the Endangered Species Act, modification of PEC's proposed construction activities to avoid taking of the listed fishes or damage to their Critical Habitat is likely to be necessary.

The second emergency rule took effect immediately on January 5. A public hearing on the proposed final rule will be conducted at 7:00 p.m., on February 11, 1983, at the BLM's Las Vegas District Office, 4765 West Vegas Drive, Las Vegas, Nevada. Comments on the proposed rule are requested from all interested persons, organizations, and agencies, and should be received by the Regional Director, U.S. Fish and Wildlife Service, Suite 1692, Lloyd 500 Building, 500 N.E. Multnomah Street, Portland, Oregon 97232, by February 22, 1983.

Woodland Caribou

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The Fish and Wildlife Service has known for some time that the herd is in trouble, but only within recent months has the full severity of its condition become apparent. On February 9, 1981, the Service published a *Federal Register* notice accepting two petitions to list the population in accordance with the Endangered Species Act. At that time, the caribou were estimated to number 20-30, about the same as during the previous decade. Since publication of the notice, evidence has accumulated that the status of the herd has deteriorated badly; the latest survey gave an actual count of only 13 individuals at all ages. Such a low population level is far below the minimum necessary to insure survival.

Effects of the Rule

Throughout the 240-day life of the emergency rule, the southern Selkirk Mountain herd of the woodland caribou will be classified as Endangered and will receive protection under the Endangered Species Act. All provisions of 50 CFR 17.21 and 17.23 now apply, including the prohibitions on taking the species and on interstate or international trafficking. Under Section 7 of the Act, Federal agencies must insure that any activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of the population. Although most of the herd's U.S. range is on USFS land, effects on that agency are not expected to be major since it has been attempting to manage its lands with consideration of the caribou's welfare in accordance with USFS policy on "sensitive" species. The rule also will apply to the activities of other Federal agencies in the area.

Better control over poaching of woodland caribou is possible since Federal agents can now be assigned to assist in enforcement of the taking prohibition. Other benefits of the listing include the authority to develop and implement a recovery plan for the herd, along with the opportunity for enhanced cooperation with the Canadian government on conservation planning.

While the southern Selkirk Mountain herd is temporarily protected, the Service is proceeding with work on a proposal to make the Endangered classification permanent.

Photo by Bob Summerfield

Areas such as these glaciated basins in the Selkirk Mountains are among the last remnants of good caribou habitat for the listed herd.

Notice Lists Candidate Vertebrate Species

The Service identified in a recent notice of review 363 United States vertebrates that are being considered for addition to the U.S. List of Endangered and Threatened Wildlife and Plants (F.R. 12/30/82). The largest number of the candidate species are fish (136), followed by birds (71), mammals (64), reptiles (47), and amphibians (45).

The animals included in the new notice are grouped in several categories in order to accurately reflect the Service's present evaluation of their conservation status. Category 1 includes 62 animals for which the Service already has substantial information to support the biological appropriateness of proposing to list the species as Endangered or Threatened, and for which the preparation and publication of such proposals are anticipated. Category 2 includes 301 species for which further information is needed to determine whether they qualify for listing. Category 3 comprises 38 species that are no longer being considered for listing as Endangered or Threatened. Among the vertebrates in Category 3 are 14 species that are presumed to be extinct; 6 that are not regarded as taxonomically valid species or subspecies; and 18 that are more widespread than formerly believed or that are not presently subject to any identifiable threat.

The notice requests information concerning the status, taxonomy, and distribution of the identified species; recommendations concerning possible designation of Critical Habitat; documentation of threats to any of the species; and nominations of taxa not included in the list. The list of candidate species will be amended periodically to reflect new information or change in the status of the species. A copy of the notice may be obtained from the December 30, 1982, *Federal Register* document or by writing the Director (OES). U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240. Comments or information on the species included in the notice may be sent to the above address.

The Service anticipates publication of a similar notice on invertebrate species in the near future. Such a notice on U.S. plants was already published in the *Federal Register* on December 15, 1980.

Regional Briefs

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agencies, and is part of the Gila Trout Recovery Plan.

A population genetics study on the bald eagle (*Haliaeetus leucocephalus*) has been initiated to determine the geographic isolation among the bald eagle populations of North America. The results may be particularly relevant to bald eagle translocation and hacking programs. Region 2 biologists are especially interested in determining if, and for how long, the Arizona breeding population has been genetically isolated from other populations.

A joint meeting of the Arizona, New Mexico, and Texas Endangered plant recovery teams will be held in Albuquerque on January 27-28 to discuss technical review drafts of recovery plans for a number of Southwestern cacti. The region's overall listing and recovery effort will also be reviewed.

Region 4—Biologists from the Asheville Endangered Species Field Office met with personnel from the Mattamuskeet National Wildlife Refuge, North Carolina Wildlife Resources Commission, Tennessee Valley Authority, North Carolina Wildlife Federation, and North Carolina State University on November 16, 1982, to discuss plans for a proposed bald eagle hacking project at the Refuge. The Service's Patuxent Wildlife Research Center, Laurel, Maryland, plans to supply the eaglets for the spring 1983 release. This will be the first attempt to hack bald eagles in North Carolina.

Region 6—Status reports have been received for three Utah fish. One fish, the Webug sucker (*Catostormus fecundus*), has been determined to be a hybrid between the Utah sucker (*C. ardens*) and the June sucker (*Chasmistes liorus*). The June sucker is endemic to Utah Lake in Utah County. Its population has declined drastically. This decline is attributed to exploitation by commercial fishermen, loss of spawning habitat, water manipulation, agricultural practices, and the introduction of nonnative fish. The third fish, the least chub (Iotichthys phlegethontis), was common at one time throughout the Great Basin drainage and occupied a variety of habitats. Today, the species is only known to occur in a few spring-marsh complexes of the Snake Valley in west central Utah. The main threats to the species are loss of habitat, hybridization, and competition.

The February 1982 BULLETIN reported that in the lawsuit brought by the Colorado River Water Conservation District and other plaintiffs against the Department of Interior and the State of Colorado, the court found that the Colorado squawfish (*Ptychocheilus lucius)* and humpback chub (*Gila cypha*) were properly listed as Endangered. On October 28, 1982, the plaintiffs appealed this ruling, and asked that the judgment be reversed to reflect findings in a Memorandum Opinion and Order issued August 3, 1981, which was in favor of the plaintiffs (see October 1981 BULLETIN). In December 1982, Federal and State defendants filed briefs regarding the appeal. No ruling has been made.

The Wyoming Game and Fish Department has hired Dave Belitsky as their Black-footed Ferret Coordinator. Dave will be stationed in Cody, which is about 30 miles north of the Meeteetse ferret (*Mustela nigripes*) population.

Region 7—Skip Ambrose, a Region 7 biologist, presented a paper entitled, "Band Recoveries of Alaska Peregrine Falcons" at the annual meeting of the Raptor Research Foundation, November 18-20, in Salt Lake City, Utah.

On December 3rd, at the Pacific Seabird Group meeting in Honolulu, Hawaii, another Region 7 biologist, Michael Amaral, delivered a slide presentation entitled, "The Endangered Aleutian Canada Goose—On the Threshold of Recovery."

As a result of a reorganization of refuge administration in Alaska, John Martin has resigned from the Aleutian Canada Goose Recovery Team and the Regional Director, Keith Schreiner, has appointed C. Fred Ziellemaker (Refuge Manager of the Aleutian Islands National Wildlife Refuge) the new team leader. During the meeting, Dr. Paul Springer reported that over 3,000 Aleutian Canada Geese (*Branta canadensis leucopareia*) have been observed in the wintering grounds thus far. This exceeds the record high count of 2,700 from 1981-1982. Included among these are 88 of the 135 geese transplanted to Agattu from the wild population of Buldir Island as part of this summer's effort to reestablish a breeding colony there. Important recommendations made by the team include: (1) increasing to 200 the number of wild geese and goslings transplanted annually from Buldir to selected release islands; (2) eliminating the introduced arctic fox (*Alopex lagopus*) populations on Amukta and Kiska Islands; and (3) appointing a representative from the Oregon Department of Fish and Wildlife to serve on the recovery team.

Forest Birds of Guam in Critical Danger

by John Engbring
Honolulu Environmental Services Office

Ten to twenty years ago, a dramatic and unexplained decline of native forest birds was noticed on the U.S. Territory of Guam and there is a growing concern that several species may soon be extinct. The decline has been so extensive that vast areas of forest are now devoid of all bird life. Ten birds have been identified as candidates for listing as Threatened or Endangered (F.R. 5/18/79), and two others are potential candidates for listing. These dozen species comprise all of Guam's native forest birds. No other Micronesian island has as many native forest species faced with such an imminent threat of extinction.

Guam is a warm, humid island in the far Western Pacific, 6,000 miles from the West Coast of the United States. It is a part of Micronesia, a region that includes the Marshall, Caroline, and Mariana Island groups. Discovered by Magellan in 1521, Guam was a Spanish colony for nearly 300 years until it was ceded to the U.S. in 1898 after the Spanish-American war. Since that time, it has been a territory of the U.S., and has remained important as a strategic military outpost.

In June 1981, the U.S. Fish and Wildlife Service and the Guam Aquatic and Wildlife Resources Division (GAWRD) conducted a joint study to assess the status of the remaining forest birds on Guam. The Guam study was the first phase of a Pacific Islands survey program being conducted by the Service's Honolulu Environmental Services Office. Birds of the U.S. Pacific Island Territories, including Guam, American Samoa, and the Pacific Island Trust Territory, are among the most isolated and poorly known of any U.S. avifauna. In many cases, the most recent species accounts are derived from military personnel stationed there during World War II.

Male white-throated ground dove

The downward trend in bird numbers was first recorded by the GAWRD, which has been conducting roadside counts and life history studies for several years.

The June 1981 survey was the first major effort to determine density, distribution, and population size for each species of native forest bird. The survey approach used was the variable circular plot method, as refined by Service bird surveys in Hawai'i. Under this method, researchers mark stations within the survey area and make 8-minute counts at each station. During each count, all birds heard or seen, and their distance from the observer, are recorded. The survey confirmed reports of a much restricted range for all native forest species, which are now found almost exclusively in the extreme northern tip of Guam.

Taxa in Jeopardy

Most forest birds of Guam are generalists and exhibit few of the evolutionary adaptations found in other insular ecosystems such as Hawai'i or the Galapagos. The resident avifauna derived mainly from the Old World, primarily the New Guinea and Philippine regions. About 90 species of birds have been recorded from Guam, but most are migrant or vagrant. The resident avifauna is comprised of 24 species, 17 native and 7 introduced. Five species of indigenous Guam birds, the Micronesian megapode (*Megapodius laperouse*), Mariana mallard (*Anas oustaleti*), white-browed rail (*Poliolimnas cinereus*), wedge-tailed shearwater (*Puffinus pacificus*), and nightingale reed-warbler (*Acrocephalus luscinia*), have been extirpated on the island since the arrival of westerners. These disappearances appear to be unrelated to the current decline, with the possible exception of the nightingale reed-warbler, which vanished in the 1960's. Results of the survey are given below:

Guam rail (*Rallus owstoni*). The Guam rail is unique in that it is the only surviving endemic rail in Micronesia. It is a flightless, ground-dwelling species, and until very recently was commonly seen along roads or in residential areas. The rail was so abundant that it was even hunted as a game species until the mid-1970's. It was once distributed islandwide, and could be found in a variety of habitats from deep forest to open fields. The populations declined severely in the 1970's, and the rail can now be found only in northern Guam and in very low densities. Because of the low number recorded during the survey, no population estimate was made. The rail continues to decline and, unless the trend is reversed, it may soon follow a number of other Pacific Island rails that have already become extinct.

Common gallinule (*Gallinula chloropus guami*). The gallinule is distributed worldwide, but this subspecies is restricted to the Mariana Islands. It is suffering primarily from the loss of wetland habitat by development and draining of low-lying areas. This is the only Guam candidate for endangered species listing that is not a forest bird, and therefore it was not sampled during the survey.

White-throated ground-dove (*Gallicolumba x. xanthonura*). Contrary to what the name implies, the ground-dove is an arboreal species and rarely seen on the ground. It is secretive when in the foliage, but can be seen occasionally as it flies above the forest canopy. Only the male has a white throat; the female is an overall brown. The subspecies is found only in the Mariana Islands and on Yap, but the species is more widespread in Micronesia. About 500 birds are estimated to remain on Guam.

Mariana fruit-dove (*Ptilinopus roseicappilla*). This is a beautiful green, yellow, orange, and purple dove whose distinctive calls once were frequently heard on Guam. Its numbers are much reduced now, and fewer than 300 are thought to remain. The fruit-dove forages in the upper canopy and, despite its bright colors, is difficult to observe. The species is endemic to the Mariana Islands, but several other members of the genus are found in Micronesia.

Vanikoro swiftlet (*Aerodramus vanikorensis bartshi*). This cave-dwelling swiftlet has undergone one of the most severe of all declines, and caves that once harbored thousands of birds are

Guam rail

Guam Aquatic and Wildlife Resources Division Photos

Cardinal honeyeater

Mariana fruit-dove

now vacant. Only the guano accumulated on the cave floor, and the old nests still clinging to the ceiling, attest to the great numbers that were once present. Only 18 birds were seen during the month-long survey, and fewer than 100 are thought to remain on Guam. Unlike all other native forest birds, which are found in northern Guam, the locus of the remnant swiftlet population is in southern Guam. The species is widespread in the Australasian region, but the subspecies is endemic to the Mariana Islands.

Micronesian kingfisher (*Halcyon c. cinnamomina*). Unlike many members of the kingfisher family, the Micronesian kingfisher is not typically associated with water habitats. Instead, it is a forest resident that forages on insects, lizards, and other small animals. This kingfisher has fared slightly better than most other Guam birds, and as many as 3,000 are thought to remain; however, it is restricted to one-fourth of its original distribution. The species is found also on Palau and Ponape, but the distinctive Guam subspecies is endemic.

Guam broadbill (*Myiagra freycineti*). The broadbill is an endemic, territorial flycatcher that once was commonly seen in the forest understory. It is a beautiful slate-blue above, and a creamy cinnamon-white below. Only a few hundred remain, and it is among the most imperiled of all forest birds.

Rufous-fronted fantail (*Rhipidura rufifrons uraniae*). The fantail is an active and conspicuous flycatcher found in the forest understory. It frequently will perch within a few meters of an observer, spreading its tail and scolding excitedly. About 1,000 individuals survive on Guam. The species is widespread in the Pacific, but the subspecies in endemic to Guam.

Bridled white-eye (*Zosterops c. conspicillata*). This small, yellowish bird is now difficult to locate and observe on Guam. Typically, it moves in small flocks that forage actively in the upper forest canopy, feeding on insects, seeds and fruits. It is now among the most restricted of all Guam birds, and occupies less than 5 percent of its original range. About 2,000 birds are estimated to remain. The species is found in the Caroline and Mariana Islands, but the subspecies is endemic to Guam.

Cardinal honeyeater (*Myzomela cardinalis saffordi*). This brilliant red and black honeyeater is the only truly nectarivorous species on Guam, although it also takes insects as part of its diet. It once was conspicuous around yards and gardens, where ornamental plants provided a good source of nectar. Like other forest birds, it is now restricted to northern Guam, where an estimated 2,500 birds survive. The species is widespread in the Pacific, but the subspecies is restricted to the Mariana Islands.

Micronesian starling (*Aplonis opaca guami*). The Micronesian starling is a conspicuous, glossy black bird that forms small, noisy flocks. It is omnivorous, and feeds mostly in the upper canopy. Since it still occupies about one-fourth of its original range, it is doing better than most Guam forest birds. The population is estimated to be 15,000. It is a widespread species in Micronesia, but the subspecies is restricted to the Mariana Islands.

Mariana crow (*Corvus kubaryi*). This crow is endemic to Guam and a small island just to the north, Rota. It is the only representative of the Corvid family in Micronesia and, in habits, size, and coloration, it is similar to the common crow (*Corvus brachyrhynchos*) of North America. A noticeable difference is its tameness; it commonly will approach to within a few meters of a human intruder. This is possibly a trait resulting from long isolation from large predators. The population on Guam is estimated to be less than 400.

Causes for the Decline

No single factor has yet been implicated in the recent decline of Guam birds, but a number of explanations have been suggested:

Disease: A likely cause for the decline of Guam birds has been the introduction of diseases. There are distinct similarities between the pattern of disappearance of birds on Guam and the pattern on Hawai'i, where it is thought that disease played a major role. Introduced birds could be serving as disease reservoirs, harboring such pathogens as avian malaria or avian pox to which the native species may have little or no resistance. Mosquitos have been introduced since the arrival of man, and also may be acting as the disease vectors. Under Pittman-Robertson and Endangered Species grants-in-aid, the GAWRD is initiating studies to determine the presence and extent of avian disease.

Introduced Predators: A number of potential predators have been introduced to Guam, and they may be affecting bird populations. Among these exotic species are rats, feral cats, pigs, dogs, a monitor lizard, and a snake. The brown tree snake (*Boiga irregularis*) is the least understood of these predators, but may be the most destructive. It was

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Mariana crow

Birds of Guam

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introduced about 1947, and has since spread throughout the island. It is known to feed on birds and bird eggs, and forages both on the ground and in trees.

Pesticides: Several pesticides, including DDT and other chlorinated hydrocarbons, have been utilized on Guam since the end of World War II, and there has been much speculation about their possible impact on forest birds, particularly insectivorous species. A study to determine the residual level of pesticides on Guam was initiated in 1981 by the Service (through the Patuxent Wildlife Research Center) and the GAWRD, funded in part by Section 6 Endangered Species grant-in-aid money. Preliminary results indicate that pesticides are not currently a problem on Guam, although they might have been in the past.

Micronesian kingfisher

Habitat Loss: Human activities have destroyed a large portion of the native forest on Guam, and the reduction in forest bird numbers can be attributed in part to this loss. Southern Guam, in particular, has lost much of its forest. It is now covered largely by eroded, grassy savannas, the result of repeated burning through centuries of human occupation. The recent decline in bird numbers, however, appears to be unrelated to habitat destruction. There remains much good forest throughout Guam that is completely devoid of bird life. On nearby islands with apparently identical habitat conditions, many of these birds, or close relatives, are quite common.

The status of forest birds on Guam is critical, and several species are in imminent danger of extinction. Counts by the GAWRD since the 1981 survey indicate that bird numbers are continuing to drop. Studies to confirm the causes of the decline are now being initiated by the GAWRD. Until the findings become available, efforts should be made to maintain the integrity of forests in the portion of northern Guam that still harbors native forest birds. Although it possibly is already too late to save some Guam species, understanding the causes for the decline might help avert similar losses on other Pacific islands.

CITES NEWS

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there does not appear to be enough information on the population status of the yacare to support moving it from Appendix II to Appendix I. The Service has decided not to submit this proposal, pending the results of further research.

- Black softshell turtle (*Trionyx ater*)—The proposal to remove this species from Appendix I is based on a report that this species is becoming genetically swamped by *T. spiniferus.* Since the Service has obtained no data to determine whether genetic swamping has actually occurred, it has decided that it would be premature to propose delisting *T. ater* at this time.
- The Service has received population and trade data that it considers to be sufficient to clearly warrant addition of the following plant species to the CITES appendices:

Add to Appendix I:

Agavaceae (Agave family)
Agave arizonica (New River agave)—AZ
A. parviflora (Santa Cruz striped agave)—AZ, Mex.
Nolina Interrata (Dehesa beargrass)—CA, Mex.

Berberidaceae (Barberry family)
Mahonia nevlnli (Nevin's barberry)—CA
M. sonnei (Truckee barberry)—CA

Crassulaceae (Orpine family)
Dudleya stolonifera (Laguna Beach dudleya)—CA
D. traskiae (Santa Barbara Island dudleya)—CA

Ericaceae (Heath family)
Rhododendron chapmanii (Chapman's rhododendron)—FLA
R. prunifolium (Plumleaf azalea)—AL, GA

Fouquieriaceae (Candlewood family)
Fouquieria fasciculata (Abrol de Barril)—Mex.
F. purpusii)—Mex.

Liliaceae (Lily family)
Lilium grayi (Gray's lilly)—NC, TN, VA
L. irldollae (Pot-of-gold lily)—AL, FL
L. occidentale (Western lily)—CA, OR
L. pitkinense (Pitkin Marsh lily)—CA

Add to Appendix II:

Agavaceae (Agave family)
Agave victoriae-reginae (Queen Victoria agave)—Mex.

Diapensiaceae (Diapensia family)
Shortia galacifolia (Oconee-bells)—GA, NC, SC

Ericaceae (Heath family)
Kalmia cuneata (White wicky)—NC, SC

Fouquieriaceae (Candlewood family)
Fouquieria columnaris (Boojum tree)—MEX.

Liliaceae (Lily family)
Lilium parryi (Parry's lemon lily)—AZ, CA

Portulacaceae (Purslane family)
Lewisia cotyledon (Siskiyou lewisia)—CA, OR
L. magulrei (Maguire's lewisia)—NV
L. serrata (Saw-toothed lewisia)—CA
L. tweedyi (Tweedy's lewisia)—WA, Can.

Copies of animal and plant proposals that the Service has submitted are available upon request from the Office of the Scientific Authority, U.S. Fish and Wildlife Service, Washington, D.C. 20240.

Recovery Plan Update

Recovery plans for three mammals and one amphibian were signed during August 1982: Eastern Couger Recovery Plan (8/2/82); Desert Slender Salamander Recovery Plan (8/12/82); Mexican Wolf Recovery Plan (8/19/82); and Morro Bay Kangaroo Rat Recovery Plan (8/18/82).

Eastern Cougar

At one time, the cougar (*Felis concolor)* occurred in all the provinces of southern Canada, throughout the United States, and in most of Central and South America. Today, sizeable populations within the U.S. are found only in the western mountains. The Endangered eastern cougar (*F. c. couguar*), one of 27 recognized cougar subspecies, originally ranged over South Carolina, Tennessee, Kentucky, Indiana, and all States to the north and east. Although many persons have considered *F. c. couguar* extinct for some time, seemingly reliable sightings have been increasingly frequent and widespread.

Fear of the large cat and its occasional depredations on livestock led early European immigrants in what is now the eastern U.S. to persecute cougars and kill them for bounty. Cougars were virtually eliminated from each region as the wilderness was settled. It is possible, however, that small numbers of cougars survived in a few remote areas because of rugged terrain, lack of access, or other factors limiting hunting success. Many of these areas have continuously supported populations of white-tailed deer (the cougar's favored prey species) and bear even after over-hunting led to these animals becoming rare over much of the East by the late 1800's. Large-scale purchases of land to form the Forest System began in 1914, and it is possible that the increasing solitude and deer populations allowed one or more small cougar populations to persist.

The continued existence of the Endangered Florida panther (*F.c. coryi)* in its coastal plain swamp habitat points out the fact that the cougar is not necessarily restricted to mountains. Many of the extensive swampy areas along the eastern coastal plain, particularly the pocosins of North Carolina, were never devoid of deer or bear and do not have vehicular access to this day. Although people seldom penetrate many of these areas, some cougar reports have been received.

In response to rising interest in cougars, the Service has sponsored a number of research and survey projects for both Endangered subspecies. Service/State work on *F. c. couguar* has been conducted in North Carolina and Virginia, and the Service is cosponsoring a survey in New York and other northeastern States. Another project at Clemson University, South Carolina, solicits reports and other evidence (investigating as many as possible), trains observers, and conducts searches for sign near the sites of the most promising reports.

By necessity, the first step of the recovery plan is to "find and delineate cougar populations." Research to determine the frequency and variability of observing cougar sign first must be conducted in areas having confirmed populations of *F. concolor.* Techniques from these areas must then be adapted for use in searches within the historic range of *F. c couguar.* These searches should be conducted on a systematic, priority basis, taking into account habitat characteristics and recently reported sightings, and should continue until all suitable areas have been surveyed adequately. If any cougars are found, interim protection will be provided immediately. An advisory committee of affected landowners and resource management agencies will be formed to plan the protection, habitat management, and public information programs, as well as to suggest and oversee further research. Later, when more information on cougar ecology is available, a permanent management plan will be drawn up to outline the long range steps needed to aid in the survival of the subspecies, increase its numbers, and conserve self-sustaining populations.

Details on the plan and its implementation can be obtained by contacting the Atlanta Regional Director (see page 2 for address).

Desert Slender Salamander

The desert slender salamander (*Batrachoseps aridus)* is a small amphibian whose known range consists of less than 0.2 hectare (0.5 acre) at a seep in Hidden Palms Canyon, part of a State ecological reserve in Riverside County, California. It is apparently a relict species that had wider distribution during wetter geological times.

This salamander measures less than 102mm (4 inches) in total length, and has a coloration of blackish maroon to deep chocolate, covered with tiny spots. It was discovered in 1969, and declared by California as Endangered in 1971. It was listed by the Fish and Wildlife Service as Endangered in 1973 due to the vulnerability of its restricted habitat. Attempts to locate other populations have so far been unsuccessful; however, several individuals of the genus *Batrachoseps* were discovered in 1981 at another site in Riverside County during a Bureau of Land Management (BLM) survey. The salamanders at this new site have been tentatively identified as *B. aridus,* although the range, status, and taxonomic affinities of this population are not yet known.

Bureau of Land Management Photo

This salamander, from the newly discovered population, is similar in appearance to those in the type locality and may eventually be proved to be the same species.

Although information on the habitat requirements of the reclusive desert slender salamander is meager, one obvious need is a constantly moist environment. Extended exposure to warm, dry air would result in death by desiccation. This poses an obvious threat to the salamander because its restricted moist habitat occurs in a region whose climate is characterized by strong vernal winds, high summer temperatures, and low, erratic rainfall. Probably the most

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Recovery Plan Update

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important structural component of the habitat is the porous limestone sheeting that covers portions of the canyon wall in the type locality. This material has built up over time due to seepage and the precipitation of mineral solutes. The sheeting retains a moist interior environment when other nearby retreats dry out, and acts as a refuge of last resort for the salamander.

Water does not usually reach the site as streamflow, but rather as constant, steady seepage from groundwater that is in turn replenished by rainfall on the 182 hectare (440 acre) watershed. Any eventual developments on private lands within this watershed could contribute to seepage contamination or changes in water percolation rates. Too much water also can be a problem. Flooding in the canyon during severe storms in 1976 eroded almost a third of the available salamander habitat. To help stabilize the habitat, particularly the limestone sheeting, the California Department of Fish and Game (CDFG) has installed gabions (large, rock-filled wire baskets) along the base of the canyon wall near the site.

The prime objective of the recovery plan is to conserve the salamander by stabilizing, protecting, and monitoring the existing habitat and maintaining a viable, self-sustaining population. In 1973, land surrounding the desert slender salamander habitat was purchased by the State of California. Construction of the gabions and actions to control access to the site are among the accomplishments of that State agency.

It is likely, however, that additional habitat conservation measures will become necessary. An increase in human activity in the watershed, such as additional groundwater pumping or water diversion, could have serious consequences for the salamander. Among the potential remedies scheduled for consideration are further habitat acquisition, lease agreements, conservation easements, or memoranda of understanding (particularly with respect to the newly discovered site, which is on BLM-administered land).

Little information is available yet on the life history, ecology, population dynamics, or habitat requirements of the desert slender salamander, and further studies will be needed to insure effective management of the species. Close monitoring of the *B. aridus* population at Hidden Palms is recommended, along with a final taxonomic determination on the newly discovered salamanders. In the meantime, searches for other populations should continue. During a recent investigation, the BLM surveyed 30 potential salamander sites. Only two additional locations were identified as suitable habitat, but no specimens were found. A follow-up survey of oases and springs in the Santa Rose and San Jacinto Mountains during periods of high surface moisture should be undertaken.

Details on the recovery plan and its implementation are available from the Portland Regional Director (see page 2 for address).

Mexican Wolf Plan

Fewer than 50 Mexican wolves (*Canis lupus baileyi)* remain in the wild, and only a handful are being held in captivity. The Service's Mexican Wolf Recovery Plan outlines a strategy for conserving and ensuring the survival of this subspecies.

C. l. baileyi has been described as the smallest in size of the 24 North American subspecies, or geographic races, of the species. The subspecies is of special scientific interest because of subtle adaptations it made to the environmental and ecological conditions at the extreme southern limits of the species range.

The Mexican wolf once ranged from southern Arizona, east to west Texas, and south to Oaxaca, Mexico. But heavy hunting and pressure to eliminate the wolf as a predator on domestic livestock essentially extirpated the animal in the United States by the 1940's, and only a remnant population remains in Mexico.

In more recent decades, wolves from the remnant Mexican population sometimes traveled the old traditional runways into the States. Until quite recently, occasional wolves continued to be reported and sometimes taken in Arizona, New Mexico, and Texas.

Mexican wolves in the wild in Mexico are extremely few, and their scarcity and separation may seriously limit further reproduction in the wild. Dilution of the remaining Mexican wolf gene pool by hybridization with the coyote or domestic dog is also at least possible as wolves become fewer and more scattered.

Therefore, the emphasis of the Service's recovery plan is the taking of wild wolves into protective custody and trying to increase their numbers in captive breeding programs. Mexico's Fauna Silvestre has agreed to the capture of as many as possible of the remaining wild wolves. Since entering into this agreement in 1980 at the meeting of the U.S.A.-Mexico Joint Committee on Wildlife Conservation, representatives of Fauna Silvestre have also indicated interest in conducting certain captive-breeding activities with trapped Mexican wolves on Mexican lands.

U.S. Fish and Wildlife Service photo

Mexican Wolf in captivity at Arizona-Sonora Desert Museum.

Because the wolf is a sensitive, social animal, programs involving it ideally should minimize the undesirable conditioning that long-term holding and breeding in captivity may produce. The recovery plan calls for facilities to be located and designed so that management of captive wolves placed in them is as much as possible like a transplant from the wild to the wild, and so that minimal human contact is involved. The idea of a preserve and of the breeding-release enclosure in Mexico is a goal of the recovery plan. A search for possible release areas in Mexico will begin in the near future.

Since all of the Mexican wolves now in captivity were taken from Mexico, reintroduction of wolves into Mexico will have top priority. Any reintroductions of Mexican wolves in the United States will depend on the availability of animals.

An on-going Mexican wolf captive breeding program began in 1977, with the capture of several animals from the

wild in Mexico. A total of 10 animals are now involved in the program at three cooperating facilities: Arizona-Sonora Desert Museum near Tucson, Wild Canid Survival and Research Center near St. Louis, and Rio Grande Zoological Park in Albuquerque.

For more information regarding the Mexican Wolf Recovery Plan, contact the Albuquerque Regional Director (see page 2 for address).

Morro Bay Kangaroo Rat

The Morro Bay kangaroo rat *(Dipodomys heermanni morroensis)* occurs only within a very restricted range on the south side of Morro Bay, in San Luis Obispo County, California. Over the past 20 years, both the occupied range and the total population of the animal have dropped more than 80 percent. Its current range, 640-650 acres, now hosts an estimated 320-340 individuals, a very low population level for a small mammal.

During the past 2 decades, the human population in the historical range of *D. h. morroensis* has increased by 600 percent. An accompanying building boom completely destroyed major portions of the kangaroo rat's original habitat range, and much of the remaining habitat is no longer suitable for the animal. The subspecies was listed as Endangered under the Endangered Species Act in 1970.

D. h. morroensis needs sandy soil in which to construct its relatively simple burrows. The animal also needs suitable plant cover to provide food, shelter, and a root system to support its burrows, which are usually close to the surface of the ground.

Early seral stages in the natural succession toward the climax coastal dune scrub vegetation of the region provides ideal habitat for the kangaroo rat. As the plant community ages, the taller growth crowds out the herbaceous species needed by *D. h. morroensis* for food, and impedes the animals' mobility.

Following fires and other land clearing activities that destroy the mature coastal dune scrub, herbaceous plants quickly colonize and produce an open, low-growing plant community that provides an ideal food source for the kangaroo rat. The animal quickly establishes itself in such "disturbed" areas, usually within 2-3 years. They can continue to inhabit such areas until the point at which the coastal dune scrub becomes dense and tall, a period anticipated to be 10-15 years. Kangaroo rat habitat can be best maintained by clearing approximately every 3-5 years.

The Morro Bay kangaroo rat is now known to exist at only four separate areas in its historical range. Much of the remaining habitat area is in private ownership and much of it has not been disturbed by fire or clearing for 30 years. Off-road vehicles, domestic cats, and housing developments are prevailing negative factors in most of these areas.

The existing range of *D. h. morroensis* is so completely separated that a drop in population in one parcel cannot be restored by movement of animals from a nearby area. These small population "islands" are quite vulnerable to minor local changes in mortality rates.

Genetic drift could also be a significant factor affecting the survival of the kangaroo rat. Changes in genetic variability brought about because of limited stock of parent animals could produce a population which is no longer representative of the original stock. Implications of genetic drift research in *D. h. morroensis* are not clear, but, as a preventive measure, the Morro Bay Kangaroo Rat Recovery Plan suggests that efforts should be made to keep populations of well over 50 individuals.

The prime objective of the recovery plan is to preserve sufficient land and maintain optimum habitat conditions on it to ensure a Morro Bay kangaroo rat population of at least 2,000 animals. The reclassification of the subspecies to Threatened classification could be considered if such a level was maintained for 3 consecutive years.

The State of California (Department of Fish and Game) recently purchased 50 acres of undeveloped land in the Pecho area adjacent to Montana de Oro State Park as the proposed Morro Dunes Ecological Reserve. It was purchased partly to protect kangaroo rat habitat from development. However, few animals exist there because of the dense vegetation which is past the successional stage best suited to them. In addition, the presence of rare plant species in this area makes it difficult to manage this land for kangaroo rat conservation.

For more information regarding the Morro Bay Kangaroo Rat Recovery Plan, contact the Portland Regional Director (see page 2 for address).

New Publications

A new book, *New England's Rare, Threatened, and Endangered Plants,* by Garrett E. Crow, is now available from the Government Printing Office (GPO). The fully illustrated, 129-page volume represents a 5-year cooperative effort involving the Service's Region 5, the New England Botanical Club's Endangered Species Committee, and the New Hampshire Agricultural Experiment Station (University of New Hampshire). Information is provided on 101 of the most rare plants in the northeast, including those that are federally listed, proposed for listing, and under review as candidates, along with others of national significance. Accounts on the most vulnerable plants include information on physical characteristics, distribution in the northeast, habitat elements, flowering period, threats, recommendations for conservation, and selected references. Twelve color plates are also included. The cost of the book is $11.00, and it can be ordered from the Superintendent of Documents, GPO, Washington, D.C. 20402 (stock number 024–010–00605–6).

Threatened and Endangered Plants of Colorado, a booklet describing those plants occurring within the State that are listed, candidates for listing, and of na-

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Photo by Aryan I. Roest

The Morro Bay kangaroo rat differs from other kangaroo rats in its smaller size and darker coloration.

New Publications

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tional concern, is now available from the Region 6 Endangered Species Office (see page 2 of the BULLETIN for address). Accounts on Colorado's five listed plants include general descriptions, line drawings and photographs, habitat information, and other data. The booklet was published (August 1982) by the Service, in cooperation with the Colorado Natural Areas Program and the Colorado Natural Heritage Inventory (CNHI), and was prepared by CNHI botanist J. Scott Peterson.

Wisconsin's Endangered Flora is now available from the Department of Natural Resources. It is a 48-page booklet describing the natural history, distribution and environmental threats to Wisconsin's 87 endangered and threatened plants. It also discusses the ecology of Wisconsin's major wild habitats: dunes, wetlands, cliffs, forests and prairie. Sixty color photographs and 32 original drawings highlight the beauty and diversity of these fragile wildflowers. To order send $2.95 in check or money order to: Wisconsin's Endangered Flora, Department of Natural Resources, Box 7921, Madison, Wisconsin 53707.

Reprints of three articles concerning wolves in Minnesota are available by writing U.S. Fish and Wildlife Service, North Central Forest Experiment Station, 1992 Folwell Avenue, St. Paul, Minnesota 55108. Please indicate which of the following reprints you wish to receive: 1) Harrington, Fred H., and L. David Mech. Fall and winter homesite use by wolves in northeastern Minnesota. Canadian Field-Naturalist, 96, 79-84; 2) Harrington, Fred H., and L. David Mech. 1982 An analysis of howling response parameters useful for wolf pack censusing. Journal of Wildlife Management, 46(3). 6226-693; 3) Mech, L. David, and Michael E. Nelson. Reoccurrence of caribou in Minnesota. American Midland Naturalist, 108(1): 206-208.

Controlled Wildlife, a three-volume reference series that will provide a simple, streamlined source of wildlife permit information for those who deal routinely with wildlife and wildlife products is in preparation by the Association of Systematics Collections.

A cumulative index of the *Endangered Species Technical Bulletin* (July 1976—December 1981) is now available. Copies may be requested by writing the Office of Endangered Species, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

The *U.S. List of Endangered and Threatened Wildlife and Plants* (50 CFR 17.11 and 17.12), reprinted January 1, 1982, is now available. Please request copies from the Office of Public Affairs—Publications, U.S. Fish and Wildlife Service, Washington, D.C. 20240.

Why Save Endangered Species? is now available from the Publications Unit, U.S. Fish and Wildlife Service, Washington, D.C. 20240. This 8-page illustrated (black and white) pamphlet is free.

BOX SCORE OF LISTINGS/RECOVERY PLANS

Category	ENDANGERED U.S. Only	ENDANGERED U.S. & Foreign	ENDANGERED Foreign Only	THREATENED U.S. Only	THREATENED U.S. & Foreign	THREATENED Foreign Only	SPECIES* TOTAL	SPECIES HAVING PLANS
Mammals	15	18	223	3	0	22	281	17
Birds	52	14	144	3	0	0	213	25
Reptiles	8	6	55	8	4	0	81	5
Amphibians	5	0	8	3	0	0	16	2
Fishes	28	4	11	12	0	0	55	20
Snails	3	0	1	5	0	0	9	1
Clams	23	0	2	0	0	0	25	0
Crustaceans	2	0	0	1	0	0	3	1
Insects	7	0	0	4	2	0	13	3
Plants	56	2	0	8	1	2	67	6
TOTAL	199	44	444	47	7	24	765	80**

*Separate populations of a species, listed both as Endangered and Threatened are tallied twice. Species which are thus accounted for are the gray wolf, bald eagle, American alligator, green sea turtle, and Olive ridley sea turtle.
**More than one species may be covered by some plans.
Number of species currently proposed: 5 animals
6 plants
Number of Critical Habitats listed: 54
Number of Recovery Teams appointed: 69
Number of Recovery Plans approved: 74
Number of Cooperative Agreements signed with States:
38 fish & wildlife
11 plants

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